I. The Drawings Satisfy All Formal Requirements

The Office Action indicates that the proposed drawings correction filed on July 9, 2002, is approved and requires corrected drawings in reply to the outstanding Office Action. In response, formal drawings are provided by a Letter to the Official Draftsperson filed herewith.

II. Claim 8 Satisfies The Requirements Under 35 U.S.C. §112, Second Paragraph

The Office Action rejects claim 8 under 35 U.S.C. §112, second paragraph, as being indefinite. In response, claim 8 is amended to recite "wherein the operation amount is calculated by the manipulated variable calculation means," to obviate the rejection. Withdrawal of the rejection of claim 8 under 35 U.S.C. §112, second paragraph, is respectfully requested.

III. The Claims Define Allowable Subject Matter

The Office Action rejects claims 8 and 10-12 under 35 U.S.C. §102(b) over WO 90/12277 to Bielle et al.; and claims 1-7 under 35 U.S.C. §103(a) over JP 08-029153 to Fukuda et al. in view of Bielle. These rejections are respectfully traversed.

Regarding claim 1, a feature of the present invention according to claim 1 is determining a swivel correction angle (an absolute quantity relative to X-axis) based on a calculated swivel angle. This feature is not disclosed in nor suggested by Fukuda and Bielle.

Further, a workpiece surface of Fukuda inherently have max/min Z-axis endpoints, which is clearly different from a start point and an end point of the present invention.

Furthermore, the present invention has a swivel correction angle display, and a swivel adjustment means and a Y-axis adjustment means, both of which an operator can manually operate. These elements are not disclosed nor suggested in Bielle and Fukuda.

Regarding claim 4, a feature of claim 4 is calculating an angle of a workpiece from coordinates of a start point and an end point to obtain an absolute value of a orientation

correction based on the angle. As described above, this feature is not disclosed nor suggested by Fukuda and Bielle.

Further, another feature of claim 4 is displaying or printing the above orientation correction values and operating an adjustment means in accordance with the displayed or printed orientation correction amount. As described above, this feature is not disclosed nor suggested by Fukuda and Bielle.

For at least these reasons, the combination of Fukuda et al. and Bielle et al. does not render obvious the subject matter of claims 1-7 under 35 U.S.C. §103(a). Withdrawal of the rejection of claims 1-7 under 35 U.S.C. §103(a) over Fukuda et al. in view of Bielle et al. is respectfully requested.

Regarding claim 8, a feature of the present invention according to claim 8 is an operation amount calculated from a center focus as an inclination of the surface of a workpiece. This feature is not disclosed or suggested by Bielle and Fukuda.

As described in page 10, lines 6-23, Bielle discloses positioning a workpiece on three supports, measuring three points on the workpiece surface corresponding to the three supports and adjusting the three supports relative to the criteria triangle.

For example, if the right measurement value (Z-axis) is 11 mm and the left measurement value (Z-axis) is 10 mm, the orientation of the workpiece can be corrected by ascending the left support by 1 mm or by descending the right support by 1 mm. This means that Bielle calculates difference among the three measurement points, not a center focus as described above.

On the other hand, the present invention measures an angle of the workpiece by calculating a center focus to obtain an operation amount based on the angle. Accordingly, it is not necessary to place the workpiece on the supports, and scale of the workpiece is not limited with the positions of the supports. Further, the present invention can be carried out, even when it is impossible to measure the positions corresponding to the supports because of holes formed in the workpiece.

In addition to the above feature, the present invention determines an absolute operation amount by calculating an inclination reference position where an inclination line connecting the fulcrum and the point of action of an inclination adjustment means is parallel with the base line of a moving means. Accordingly, even if a stage is inclined relative to the base line, which causes a measurement error, the error van be eliminated (see page 18, lines 29-35 of the specification and Fig. 12).

In response to the Office Action's assertions regarding Fig. 10 of Bielle, the figure relates to displacement detection of a touch sensor and adjustment thereof, not to angle correction of a workpiece. Specifically, Fig. 10 shows a method of widening measurement range when the touch sensor comes close to an end of the measurement range digitized into 12 bits (0-4095), which has no relation to absolute operation amount.

Furthermore, the present invention has the calculated operation amount displayed, printed or output as data, and an inclination adjustment means which an operator can manually operate, which realize semiautomatic operation.

Though the Office Action considers the present invention as a normal manual operation, we respectfully traverse this assertion. As implied in the face that the filing date of Fukuda is earlier than that of the present application, the present invention could be made only after Fukuda (full-automatic operation) was made and its disadvantages were found.

For at least these reasons, Bielle et al. does not anticipate the subject matter of claims 8 and 10-12 under 35 U.S.C. §102(b). Withdrawal of the rejection of claims 8 and 10-12 under 35 U.S.C. §102(b) over Bielle et al. is respectfully requested.

IV. Conclusion

In view of the foregoing amendments and remarks, Applicants submit that this application is in condition for allowance. Favorable examination and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Richard J. Kim
Registration No. 48,360

JAO:RJK/sld

Attachments:
Appendix
Information Disclosure Statement
Letter to the Official Draftsperson

Date: November 5, 2002

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fee due to our Deposit Account No. 15-0461

APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims 1, 4 and 8:

1. (Twice Amended) A surface texture measuring machine for measuring a surface texture of a workpiece held on a workpiece orientation adjustment stage, the workpiece having an edge line, the workpiece orientation adjustment stage being movable in a measurement direction (X-axis direction) and in a direction (Y-axis direction) orthogonal with the X-axis direction within a horizontal plane and rotatable in a X-Y plane, the workpiece orientation adjustment stage being capable of seesawing in a direction (Z-axis direction) orthogonal with the X-axis direction within a perpendicular plane, and the surface texture of the workpiece being scanned by a sensor movable in the X-axis direction after adjusting orientation of the workpiece orientation adjustment stage, the surface texture measuring machine comprising:

a measurement controller for adjusting the orientation of the workpiece orientation adjustment stage; and

a measurement means being controlled by the measurement controller,

the measurement controller comprising: a surface texture measurement controller for measuring the surface texture of the workpiece; a X-axis coordinates input means for inputting X-axis coordinates at a measurement start point and a measurement end point in adjusting the orientation of the workpiece orientation adjustment stage; a Y-axis coordinates input means for inputting Y-axis coordinates at a measurement start point and a measurement end point in adjusting the orientation of the workpiece orientation adjustment stage; a swivel correction angle calculation means for calculating a swivel angle (an angle within the X-Y plane relative to X-axis) from the x-axis coordinates inputted by the x-axis coordinates input means and determining a swivel correction angle (an absolute quantity relative to the X-axis) ~~from the X-axis coordinates inputted by the X-axis coordinates input~~

~~means~~ based on the swivel angle and the Y-axis coordinates inputted by the Y-axis coordinate input means; and a swivel correction angle display for displaying the swivel correction angle calculated by the swivel correction angle calculation means,

the measurement means comprising: ~~a Y-axis adjustment means~~ a swivel adjustment means which an operator can manually operate for rotating the workpiece orientation adjustment stage within the X-Y plane to adjust orientation thereof in accordance with the swivel correction angle displayed on the swivel correction angle display; and a Y-axis adjustment means which the operator can manually operate for adjusting orientation of the workpiece orientation adjustment stage by ~~manually~~ displacing the workpiece orientation adjustment stage in the Y-axis direction ~~in accordance with the swivel correction angle displayed on the swivel correction angle display; and a swivel adjustment means for manually rotating the workpiece orientation adjustment stage within the X-Y plane to adjust orientation thereof~~.

4. (~~Twice~~ Three Times Amended) An orientation-adjustment method of a workpiece using a surface texture measuring machine, the workpiece having an edge line, the workpiece orientation adjustment stage being movable in a measurement direction (X-axis direction) and in a direction (Y-axis direction) orthogonal with the X-axis direction within a horizontal plane and rotatable in a X-Y plane, the workpiece orientation adjustment stage being capable of seesawing in a direction (Z-axis direction) orthogonal with the X-axis direction within a perpendicular plane, and the surface texture of the workpiece being scanned by a sensor movable in the X-axis direction after adjusting orientation of the workpiece orientation adjustment stage, the orientation adjusting method comprising the steps of:

measuring positions of the workpiece relative to the sensor at a measuring start point and a measurement end point;

calculating orientation of the workpiece from the positions to determine an angle of the workpiece to the measurement direction to obtain an absolute quantity of an orientation correction amount ~~to the measurement direction~~based on the angle;

displaying or printing the orientation correction amount; and

operating an adjustment means of the workpiece orientation adjustment stage in accordance with the displayed or printed orientation correction amount to correct the orientation of the workpiece.

8. (~~Twice~~ Three Times Amended) An leveling device for a surface texture measuring machine, the surface texture measuring machine comprising: a displacement detecting means movable in a measurement direction (X-axis direction) for measuring displacement (z-axis direction) on a surface of a workpiece; and a moving means for moving the displacement detecting means in the measurement direction to scan a displacement signal from the displacement detecting means, the surface texture measuring machine adjusting an amount of a workpiece stage relative to a base line as a movement locus of the displacement detecting means, the leveling device comprising:

a fulcrum ~~during~~ for rotatably supporting the workpiece stage during measurement and adjustment and a point of action working relative to the fulcrum;

a manipulated ~~valuable~~ variable calculation means for scanning the surface of the workpiece by the displacement detecting means and for calculating a center locus, a inclination of the surface of the workpiece, of measurement data based on a displacement signal from the displacement detecting means to calculate a operation amount at the point of action relative to the fulcrum required for paralleling the center locus with the base line of the moving means;

an output means for displaying, printing or outputting as data the operation amount; and

an inclination adjustment means which an operator can manually operate to adjust the inclination of the workpiece stage relative to the X-axis on X-Z plane for manually adjusting inclination of a predetermined amount, wherein the operation amount is calculated by the manipulated variable calculation means from an inclination reference position where an inclination line connecting the fulcrum and the point of action of the inclination adjustment means is parallel with the base line of the moving means.